

CEMENT



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CEMENT

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GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

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8 Cement

The cement industry in India after being delicensed in 1991 has shown remarkable growth. India has emerged as the second largest country in the world after China in the production of cement. Cement is a basic construction material in housing, infrastructure and large projects for social development like irrigation dams, hospitals, roads, etc. It has become synonymous with construction and per capita consumption of cement is accepted as an important index of the country's economic growth.

In terms of quality, technology, productivity and efficiency, India compares well with the best in the world. The Indian cement industry plays a key role in the national economy, generating substantial revenue for State and Central Governments as well as employment. Cement is the basic building material in India and is used extensively in urban housing, industrial sector and developing infrastructure.

India exported about 3.40 million tonnes cement valued at ₹ 1042 crore (including 1.27 million tonnes clinker and 0.08 million tonnes white cement) in 2011-12 to Sri Lanka, Nepal, Bhutan, South Africa, Bangladesh, etc.

In 2011-12, there were 173 large cement plants having total annual installed capacity of 300.21 million tonnes in addition to mini and white cement plants having total estimated capacity of 6 million tonnes per annum. The total installed capacity for cement in the country was thus about 306.21 million tonnes per annum. In 2011-12, the annual installed capacity of large cement plants has risen by 5.78 million tpy to 300.21 million tpy from 294.43 million tpy in 2010-11.

Production of cement by large plants also rose to 224.25 million tonnes from 210.28 million tonnes in 2010-11. The production from mini and white cement plants is estimated at 6 million tonnes in 2011-12. Thus, the estimated domestic production of cement was 216.28 million tonnes in 2010-11 and 230.25 million tonnes in 2011-12. Three cement plants, having a total capacity of 9,90,000 tonnes per year produced white cement. Most of these capacities are modern and based on the energy-efficient dry process technology.

There were as many as 112 plants with a million tonnes or more capacity. There was only one central public sector undertaking in the cement sector, i.e., CCI which had 10 operating units, spread over eight States/Union Territories. Except for Bokajan, Rajban and Tandur units, remaining cement plants are lying closed for about a decade or more. There were five large cement plants owned by various State Government Undertakings like Tamil Nadu Cement, Malabar Cements and Mawmluh Cherra Cement Ltd. The companywise annual installed capacities of large cement plants are given in Table-1. Regionwise and Statewise installed capacities and production of large cement plants are given in Table-2.

The total production of cement reached to about 230.25 million tonnes in 2011-12, a growth of about 6.5% over the preceding year. In 2011-12, the annual installed capacity of three white cement plants was 9.90 lakh tonnes. The mini-cement plants were meant to tap scattered limestone reserves, mostly in Andhra Pradesh, Gujarat, Rajasthan and Madhya Pradesh.

Data on overall capacity, production and growth in cement industry are given in Table-3.

CEMENT

**Table – 1 : Companywise Annual Installed Capacities, 2011-12
(Large Cement Plants)**

Company	Plant	No. of plants	Annual installed capacity (million tonnes)
ACC Ltd	Chaibasa, Chanda, Jamul, Kymore, Lakheri, Thondebhavi, Madukkarai, Sindri, Wadi I & II, Gagai I & II, Damodar Cement Works, Tikaria (G), Bargarh Cement Works, Kudithini	16	28.80
Birla Corp. Ltd	Birla Vikas & Satna, Birla Cement & Chanderia, Durgapur (G), Rae Bareli (G), Durga Hitech (G)	7	5.78
CCI Ltd	Adilabad, Akaltara, Bokajan, Charkhi-Dadri, Kurkunta, Mandhar, Neemuch, Rajban, Tandur, Delhi (G)	10	3.85
Andhra Cements	Vizag (G), Nadikude-Durga Cement	2	1.42
J.K. Group	Nimbahera, Mangrol, Gotan, Muddapur, Lakshmi Cement, Lakshmi Cement-Kalol (G)	6	12.27
Century Textiles	Century Cement, Maihar Cement, Manikgarh Cement	3	7.80
India Cements	Sankarnagar, Sankaridurg, Chilamkur Works, Dalavoi, Visaka Cement, Yerraguntla, Raasi Cement, Vallur(G), Parli(G), Trinetra Cement	10	15.85
Tamil Nadu Cement	Alangulam, Ariyalur	2	0.90
Madras Cements	Ramasamyraja Nagar, Jayantipuram, Alathiyur Works I & II, Ariyalur, Uthiramerur(G), Salem(G), Kolaghat(G)	7	12.72
Mehta Group	Saurashtra Cement, Gujarat Sidhee Cement	2	2.70
Ultra Tech Cement Ltd	Rajashree, Hotgi (G), Vikram, Aditya I & II, Rawan, Reddipalyam, ACW, JCW(G), HCW, Gujarat, APCW-I & II, Jafrabad, Magdalla (G), Ratnagiri (G), ARCW (G), Bhatinda(G), WBCW (G), Dadri(G), Panipat (G),Ginigera (G), Kotputli, Aligarh (G)	22	48.75
Ambuja Cements Ltd	Ambuja Cement, Gajambuja Cement, Ambuja Cement-Himachal Pradesh (2), Ambuja Cement Ropar (G), Ambuja Cement Rabriyawas, Ambuja Cement-Bhatinda (G), Maratha Cement; Ambuja Cement Roorkee (G), Ambuja Cement Bhatapara, Ambuja Cement Sankrail (G), Ambuja Cement Magdella (G), Ambuja Cement Farakka (G)	13	27.35
Jaypee Cement Ltd	Jaypee Rewa, Jaypee Bela, Jaypee Sadva Khurd (G), Jaypee Ayodhya (G), Dalla, Chunar (G), Jaypee Panipat (G), Jaypee Sidhi, Jaypee Kutch, Jaypee Wanakbori (G), Jaypee Roorkee(G), Jaypee Bagheri, Bhilai Jaypee	16	27.05
Kesoram Industries	Kesoram Cement, Vasvadatta Cement	2	7.25
Mangalam Cement	Mangalam Cement, Neer Shree Cement	2	2.00
Orient Paper Industries	Orient Cement, Orient Cement-Jalgaon (G)	2	5.00

(Contd.)

CEMENT

Table-1 (Concl.d.)

Company	Plant	No. of plants	Annual installed capacity (million tonnes)
Penna Cement Industries	Penna Tadippatri I & II, Penna Ganeshpahad, Penna-Boyareddypalli Ltd, Penna -Tandur	4	6.50
Prism Cement	Prism Cement I & II	1	5.60
Lafarge India (P) Ltd	Arasmeta, Sonadih, Jojobera (G), Mejia (G)	4	7.75
Malabar Cements	Malabar Cements, Malabar Cements (G)	2	0.62
Binani Cement	Binani Cement Sirohi, Binani Cement Sikar (G)	2	6.25
Rain Cements Ltd	Rain Comdt. Unit I, Rain Comdt. Unit LN-1, Rain Comdt. Unit LN-2	2	4.00
KCP Ltd	KCP Ltd-Macherla, Maktyala	2	2.35
OCL India Ltd	OCL India-Rajgangpur, OCL India-Kapilas (G)	2	5.35
Dalmia Cements	Dalmia-Dalmiapuram, Dalmia-Kadapa, Dalmia - Ariyalur	3	9.00
Cement Manu. Co. Ltd	Cement Manu. Co. Ltd, Megha T&E (P) Ltd (G)	2	1.27
Chettinad Cement	Chettinad-Karur, Chettinad Karikkali, Chettinad-Ariyalur	3	10.50
Zuari Cement Ltd	Zuari Cement, Sri Vishnu Cement	2	3.40
Heidelberg Cement (I) Ltd,	HCIL - Ammansandra, Damoh, Jhansi (G), Dolvi (G)	4	3.10
Shree Cement	Shri - Beawar, Ras, Khushkhera(G), Suratgarh(G), Roorkee(G), Jaipur (G)	6	13.39
Others*	Shree Digvijay-Sikka, Khyber Inds. (P) Ltd, Bagalkot Cement & Ind. Ltd, J&K Ltd, Kalyanpur Cement, Mawmluh Cherra, Panyam Cements, Meghalaya Cements Ltd, Shriram Cements, Sanghi Industries Ltd, My Home Industries, Meghalaya Cements Ltd, Anjani Portland Cements	12	11.64
Grand Total		173	300.21

Figures rounded off. **Source:** Cement Manufacturers' Association, New Delhi.

* In addition, the following plants produced white cement:

(i) Grasim Industries Ltd (White Cement Division), Kharia Khangar, Jodhpur district, Rajasthan (560,000 tpy);

(ii) J.K. White Cement Works, Gotan, Nagaur district, Rajasthan (400,000 tpy); and

(iii) Travancore Cements Ltd (a Kerala Government Undertaking), Muhamma, Alappuzha district, Kerala (30,000 tpy).

(G): Grinding Unit.

CEMENT

**Table – 2 : Regionwise/Statewise Installed Capacities and Production, 2010-11 and 2011-12
(Large Cement Plants)**

(In million tonnes)

Region/State	No. of Plants	Annual Installed Capacity 2011-12	Production	
			2010-11	2011-12
Northern Region	31	52.56	37.94	42.36
Haryana	3	2.97	1.93	1.93
Punjab	1	1.75	1.48	1.54
Rajasthan	19	40.86	30.92	34.10
Himachal Pradesh	3	2.95	2.07	2.61
Delhi	1	0.50	Nil	Nil
Jammu & Kashmir	2	0.53	0.14	0.18
Uttarakhand	2	3.00	1.40	2.00
Eastern Region	24	32.79	23.16	24.60
Assam	1	0.20	0.13	0.10
Meghalaya	4	2.11	1.55	1.60
Bihar	1	1.00	0.76	0.63
Jharkhand	2	6.70	3.50	4.36
Odisha	3	6.35	4.50	4.26
West Bengal	5	4.80	3.38	3.85
Chhattisgarh	8	11.63	9.34	9.80
Southern Region	54	96.57	59.95	60.82
Andhra Pradesh	27	47.25	28.97	29.75
Tamil Nadu	18	34.38	20.63	20.97
Karnataka	7	14.32	9.78	9.57
Kerala	2	0.62	0.58	0.53
Western Region	17	30.52	21.71	24.67
Gujarat	10	18.72	12.18	14.43
Maharashtra	7	11.80	9.53	10.24
Central Region	18	31.61	26.24	27.55
Uttar Pradesh	9	9.33	7.05	7.02
Madhya Pradesh	9	22.28	19.19	20.53
Grand Total	144	244.05	169.00	180.00

Source: Cement Manufacturers' Association, New Delhi. Figures rounded off individually.

Table – 3 : Capacity, Production and Growth in Cement Industry, 2007-08 to 2011-12

(In million tonnes)

Year	Capacity growth			Production growth		
	Annual capacity	Growth	% Growth	Production	Growth	Growth%
2007-08	209.40	31.57	17.75	172.31	10.65	6.58
2008-09	230.61	21.21	10.13	185.61	13.30	7.72
2009-10	276.77	46.16	20.02	204.95 ^(e)	19.34	10.42
2010-11	296.48 ^(e)	19.71	7.12	216.28 ^(e)	11.33	5.53
2011-12	306.21	9.73	3.28	230.25	13.97	6.45

Source: Cement Manufacturers' Association, ACC Ltd, and Ambuja Cements Ltd.

CEMENT

Keeping pace with the physical growth of the industry, tremendous strides have been made in technological upgradation and assimilation of latest technology. Upgrading by converting wet process plants to semi-dry and full dry process has resulted in economy of fuel and power consumption. Wet process capacity which accounted for 97% in 1950 was brought down to 3% by 2005. Dry process accounted for 96% and semi-dry process 1 per cent.

A large number of mega plants with capacity of one million tonnes and above, possessing the latest technological features like roller process, vertical roller mills, process control equipment and efficient pollution control devices have emerged in different parts of the country. The induction of advanced technology has helped the industry immensely to conserve energy & fuel and to save substantially the raw materials.

India is producing different varieties of cements like Ordinary Portland Cement (OPC), Portland Pozzolana Cement (PPC), Portland Blast Furnace Slag Cement (PBFSC), Oil-well Cement, Rapid Hardening Portland Cement, Sulphate Resistant Portland Cement (SRPC) and White Cement. BIS covers two types of PPC, viz, IS 1489 (Part1): 1991 (Reaffirmed 2009) Flyash-based and IS 1489 (Part 2):1991 (Reaffirmed 2009) Calcined clay-based. PPC is suitable for all general construction, particularly for marine & hydraulic construction and other mass concrete structures. Portland Slag Cement (PSC)-IS 455:1989 (Reaffirmed 2009) is particularly useful for marine works. BIS specifies three grades of OPC (i) IS 269:1989 (Reaffirmed 2008) i. e. 33 grade suitable for all general constructions, particularly for masonry and plastering works (ii) IS 8112:1989 (Reaffirmed 2009), i. e., 43 grade is particularly suitable for high strength concrete work, and (iii) IS 12269:1987 (Reaffirmed 2008) i.e. 53 grade suitable for specialised work such as precast concrete, prestressed concrete, long span structures/bridges, tall structures, etc. All these varieties of cement are produced strictly conforming to the BIS specifications for maintaining high quality. The Cement Quality Control Order dated 12 February 2003 issued under the BIS Act ensures quality of cement produced and sold in the market. Some cement plants have set up dedicated jetties for promoting bulk transportation and export.

The cement capacity in the country is mostly concentrated near the main raw material source; i.e., limestone. Other important raw material is coal (0.25 tonne required per tonne of cement). Many cement plants are situated near the coal belts in eastern Madhya Pradesh, primarily due to two reasons, namely, (i) less freight cost incurred to transport coal, and (ii) inability of domestic coal producers to supply

complete requirement of cement plants due to fall in production and prioritised supply to power plants. However, limestone reserves have been the primary consideration in location of plants. Presence of clusters of capacity and the high transportation cost make the cement market regional in nature with the producers supplying cement to areas around the location of the plant.

Operating Cost

Power, coal and freight constitute about 15-20% each of the total cement cost while capital cost (interest and depreciation) forms 20-30 per cent. Although, the industry is largely under private sector, Government controls more than 40% of the cost. Power, coal and freight costs are all regulated by Government bodies, such as, State Electricity Boards, Coal Monopolies and the Railways.

Power is a major parameter that influences the operating cost. Grid power purchased from SEBs is costlier than captive power from coal-based plants by more than 25-30 per cent. Where conditions are favourable, setting up captive wind power farms has become a realistic option for cement plants with operating cost at ₹ 0.50 per unit (kWh) power excluding capital cost, interest and depreciation.

Coal Distribution

Coal being a low value, bulky product with regional concentration of deposits entails incurrence of freight costs that constitute a substantial part in the final cost of cement. Rail is the predominant form of transport with road transport used by plants located close to pitheads. The Government in its notification to the cement industry has permitted cement plants to operate their own captive coal mines. Many cement plants have expressed interest in taking up coal blocks on lease and operating the mines for coal. As proposed by the Government, cement is one of the core sectors for which captive mining blocks would be allocated.

Power Availability

The industry's average energy consumption is estimated to be about 725 kcal/kg clinker thermal energy and 80 kWh/t cement electrical energy. The best thermal and electrical energy consumption presently achieved by the Indian cement industry is about 667 kcal/kg clinker and 67 kWh/t cement which are comparable to the best reported figures of 660 kcal/kg clinker and 65 kWh/t cement in a developed country like Japan. Since the controls were lifted, aggregate power requirements have grown rapidly with rising cement capacity without commensurate growth in power generating capacity in the country. To offset the power

crisis situation, many cement plants have set up installations for captive power generation. Further, as part of reform process in coal sector, the Government has also permitted 100% FDI in captive coal blocks in cement sector along with power and steel to facilitate and augment power availability.

Freight Costs

Logistics in the cement sector affect freight costs to a large extent. The basic raw materials for manufacturing cement such as, limestone and coal are low value high bulk material and, as a result, entail huge freight cost which form the single largest cost component, usually accounting for 33% of the variable costs. During 1990s, the most significant developments were the emergence of big plants and formations of clusters of cement plants. These clusters, typically located far away from the major consumption centres meant that cement has to be transported over very long distances. The Indian Railways transported 99.08 million tonnes cement in 2010-11 as against 93.15 million tonnes of cement in 2009-10, as a part of revenue earning freight traffic. Alternatively, the cost-conscious manufacturers have attempted to use sea route for transportation as sea route is cost-effective and could benefit coast-based manufacturers.

Cost Control

Cement producers of the country have continuously attempted to lower the cost by various methods like:

- improved efficiency by increasing usage of captive power;
- locating units closer to the market place;
- increasing production of blended cement;
- availing of various State incentives like sales tax exemption; power tariff; exemption/concession (Himachal Pradesh and Tamil Nadu);
- conversion from wet to dry process, wherever possible, depending on quality of limestone; and
- enhanced capacities to achieve economy of scale. (Expansion is the preferred route. A new plant costs thrice the cost of expansion).

Environment

Ministry of Environment and Forests has notified the emission standards for cement plants in 1987, which was subsequently revised in February, 2006. In India, the permissible stack dust emissions from various sources for existing cement plants is 1.50 mg/Nm³ and 100 mg/Nm³ for plants located in critically polluted

areas. However, the limit for new plants in our country is 50 mg/Nm³ which is at par with some of the developed countries. All large plants have provided necessary air pollution control equipment to control dust emissions. Thermal power stations use bituminous or sub-bituminous coal and produce large volumes of fly ash. Fly ash is a fine glass like powder recovered from gases created by coal-fired electric power generation. These micron sized earth elements consist primarily of silica, alumina and iron. When mixed with lime and water the fly ash forms a cementitious compound with properties very similar to portland cement. For producing one tonne of cement about 0.2 tonnes of fly ash can be used. It not only reduces the cost of cement using fly ash by 5 to 10% but also saves on transportation & disposal of materials and 30 to 40% of land required for the power projects towards ash handling. A 1,000 MW project requires around 1,000 acres for ash dykes for a 25 year period for storing of fly ash.

At present, about 95 million tonnes fly ash is being generated annually. It is estimated that about 32% utility of fly ash can be made in cement industry. Promoting use of fly ash would be an environment-friendly measure without sacrificing the quality of OPC.

The Reliance Cement's Butibori Unit (Phase-I), Maharashtra State was commissioned in 2012 and that of Maihar Unit is on a fast track and slated to be commissioned in 2013. Reliance's another projects located at Gondavali (blending unit) and Rae Bareilly (grinding unit) in Uttar Pradesh and Yavatmal (integrated unit) in Maharashtra State. NTPC is also learnt to have plans to manufacture cement near six of its power plants through joint ventures. Grasim Industries Ltd, Ultratech Cement Ltd, Sanghi Cement Ltd, India Cement Ltd, Zuari Cement Ltd and My Home Industries Ltd, among others are learnt to have evinced interest to set up greenfield cement plants in the vicinity of 4,000 MW each ultra power projects in order to utilise the fly ash that would be generated from them.

Industrial wastes such as petcoke, tar waste and by-products such as red mud from aluminium industries, ferrous and non-ferrous slag from steel and other industries, phospho-chalk and phospho-gypsum from fertilizer industries, lime sludge from paper and sugar industries, carbide sludge from carbide industries and phosphorus furnace slag, etc. are now finding use in manufacture of cement. Cement plants in India utilised about 27% of fly ash generated by thermal power plants and almost all the granulated slag generated by steel plants in 2010-11.

Ready-Mix Concrete Industry

Ready-mix concrete (RMC) is a relatively nascent market in India accounting for only about 0.5% of the demand. RMC is ready-to-use concrete blend of cement, sand and aggregate and water mixed in convenient proportion. It was first launched in Mumbai a few years ago and is gaining ground in other metros in India. RMC is a corollary to bulk handling and transportation of cement. It has several advantages. It is produced under controlled conditions and hence has consistency in quality and it can be directly powered in the required form, saving time and improving the quality of construction.

POLICY

Foreign Trade Policy (FTP) for 2009-14 was announced on 27.08.2009 and came into force w.e.f. 27.08.2009. The Export & Import Policy incorporated in the FTP for cement is free. The import of cement includes portland cement, white cement, aluminous cement, slag cement, super sulphate cement and similar hydraulic cements, whether or not coloured or in the form of clinkers, under ITC (HS) Code 2523 is free. The export of cement is also free.

Development Council for Cement Industry

Development Council for Cement Industry has been set up under Section 6 of the Industrial (Development & Regulation) Act, 1951. The activity of the Council is funded through the cess collected from Cement Manufacturers in terms of the Cement Cess Rules, 1993. The Cement Council promotes development of the cement industry by providing funds for development projects in areas of base level activities of National Council for Cement & Building Materials, and R&D, improving productivity by reducing cost, optimum utilisation of raw materials, modernisation of cement plants, improvement of environment, standardisation and quality control progress, bulk supply and distribution of cement, training and upgradation of skill in cement industry.

WORLD REVIEW

The cement production in 2011 was estimated at 3,600 million tonnes. China (2,100 million tonnes) was the largest producer in the world, contributing about 58% to the world output, followed by India (240 million tonnes), USA (68 million tonnes) and Japan (51 million tonnes) (Table-4).

FOREIGN TRADE

Exports

Export of cement (total) decreased marginally to 3.4 million tonnes in 2011-12 from 3.49 million tonnes in 2010-11. In 2011-12, exports of portland grey cement were 1.96 million tonnes and those of cement clinker 1.27 million tonnes in the total cement exports. Exports of portland white cement and other cements were 81,467 tonnes and 92,842 tonnes, respectively. Exports of cement in 2011-12 were mainly to Sri Lanka (59%), Nepal (26%) and South Africa (2%) (Tables - 5 to 9).

Imports

Cement imports in 2011-12 decreased sharply to 1.01 million tonnes from 1.09 million tonnes in 2010-11. In 2011-12, imports of grey cement were 7.46 lakh tonnes, those of cement clinker 1.46 lakh tonnes, other cements 1.09 lakh tonnes and white cement about 9 thousand tonnes. Main suppliers in 2011-12 were Pakistan (59%), Bangladesh (22%) Vietnam (9%) and China (6%) (Tables - 10 to 14).

**Table – 4 : World Production of Cement
(By Principal Countries)**

	(In '000 tonnes)		
Country	2009	2010	2011
World: Total (rounded)	2800000	3310000	3600000
Brazil	53000	59100	64100
China	1400000	1880000	2100000
Egypt	40000	48000	44000
France	21000	-	-
Germany	33000	29900	33500
India	180000	210000	240000
Indonesia	37000	22000 ^(e)	30000
Iran	45000	50000	61000
Italy	43000	36300	33100
Japan	60000	51500	51300
Rep. of Korea	53000	46000	48300
Mexico	45000	34500	35400
Pakistan	40000	30000	32000
Russia	55000	50400	55600
Saudi Arabia	32000	42300	48400
Spain	42000	23500 ^(e)	22200
Thailand	35000	36500 ^(e)	36700
Turkey	51000	62700	63400
USA	72800	67200	68600
Vietnam	37000	50000	59000
Other countries (rounded)	425200	480100	473400

Source: Mineral Commodity Summaries, 2012 & 2013.

CEMENT

**Table – 5 : Exports of Cement : Total
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	3494859	9184336	3398546	10421215
Sri Lanka	917505	1841620	2012486	5640835
Nepal	1770015	5236139	890117	2976356
Bhutan	785	3197	58838	357149
South Africa	69181	214157	81314	285682
Bangladesh	20605	52922	57417	172550
Maldives	49978	181316	48074	164472
Madagascar	58422	108380	61147	138861
Reunion	-	-	43120	93181
Mozambique	52561	108453	24199	80348
UAE	51529	135915	14915	73941
Other countries	504278	1302237	106919	437840

**Table – 8 : Exports of Cement Clinker
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	1088821	2294170	1267166	2738494
Sri Lanka	227581	391364	687113	1489229
Nepal	601299	1409033	461355	966680
Bangladesh	13357	32913	44787	118846
Reunion	-	-	43120	93181
Australia	-	-	29106	62897
Bhutan	-	-	991	5527
Guyana	-	-	13	86
Germany	7	7	14	25
USA	2	29	2	14
Unspecified	-	-	662	2004
Other countries	246575	460824	3	5

**Table – 6 : Exports of Cement (Portland Grey)
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	2153707	5917218	1957071	6016126
Sri Lanka	667633	1397152	1316010	4111914
Nepal	1062047	3464368	343632	1012377
Bhutan	145	727	52665	183641
South Africa	53520	136528	62767	172193
Maldives	48972	177100	47550	161808
Madagascar	58365	108029	61063	138329
Mozambique	1409	7447	22080	63309
Seychelles	3098	11301	18036	52161
Bangladesh	2120	7395	11174	47246
Comoros	-	-	16792	45937
Other countries	256398	607171	5302	27211

**Table – 9 : Exports of Cement (Others)
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	104141	340457	92842	1190224
Nepal	80270	238003	72712	906737
Bhutan	500	1010	5182	167981
South Africa	144	2068	1668	21560
Sri Lanka	2076	6281	5961	19497
Mozambique	500	3358	1665	14144
Netherlands	300	4337	660	10412
Belgium	100	1447	620	9738
Bangladesh	4773	11660	1400	6039
Senegal	-	-	433	3767
Iran	1098	7360	149	3280
Other countries	14380	64933	2392	27069

**Table – 7: Exports of Cement (Portland White)
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	148190	632491	81467	476371
South Africa	15517	75562	16879	91929
Nepal	26399	124735	12418	90562
UAE	19152	78301	14851	73142
Thailand	6117	32317	7434	45475
Nigeria	6647	36637	6736	42353
Kenya	4167	20990	5567	32034
Tanzania Rep.	1966	7161	3609	20769
Sri Lanka	20215	46822	3402	20195
Saudi Arabia	38344	160366	3097	15504
Chinese Taipei/ Taiwan	2948	12830	2565	13468
Other countries	6718	36770	4909	30940

**Table – 10 : Imports of Cement :Total
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	1095624	3526386	1011064	3795837
Pakistan	594481	1688541	599400	1972247
Bangladesh	289084	1056092	224167	898940
China	177999	542014	57625	385065
Vietnam	-	-	90501	233406
France	994	28767	1979	49552
UAE	4800	31086	6168	44070
Germany	7422	74223	2659	40957
Malaysia	8896	29920	6511	31548
Netherlands	1264	24779	1191	25236
Chinese Taipei/ Taiwan	-	-	333	23876
Other countries	10684	50964	20530	90940

CEMENT

**Table – 11 : Imports of Cement (Portland Grey)
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	780180	2366507	746028	2542808
Pakistan	585526	1655978	592257	1944531
Bangladesh	186780	686683	128294	521315
China	700	2055	5892	17828
Sri Lanka	700	2043	3724	11663
Bhutan	2738	10009	1086	4574
Guinea Bissau	-	-	1400	4422
Hong Kong	-	-	1260	3870
Malaysia	-	-	980	3718
Afghanistan	516	997	1536	3193
Ghana	-	-	980	3068
Other countries	3220	8742	8619	24626

**Table – 12 : Imports of Cement (Portland White)
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	7910	50230	9613	65832
UAE	4760	30004	5859	41624
Pakistan	2885	15102	3026	17912
China	25	776	367	3600
Tanzania	-	-	280	1944
Thailand	-	-	24	464
Japan	-	-	56	274
USA	-	-	1	13
Other countries	240	4348	++	1

**Table – 13 : Imports of Cement Clinker
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	184033	420351	145897	397100
Vietnam	-	-	90501	233406
China	172533	383740	43107	120127
Malaysia	8894	29890	5460	24711
Pakistan	280	801	4117	9805
Afghanistan	163	281	1518	3160
Thailand	-	-	310	1839
Hong Kong	-	-	260	1012
Mayanmar	-	-	156	800
Belgium	-	-	156	754
Japan	-	-	156	745
Other countries	2163	5639	156	741

**Table – 14 : Imports of Cement (Others)
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	123501	689298	109526	790097
Bangladesh	102204	369049	95873	377625
China	4741	155443	8259	243509
France	994	28767	1363	47575
Germany	7422	74223	1859	38972
Chinese Taipei/ Taiwan	-	-	333	23876
Netherlands	564	22850	547	23375
Norway	-	-	52	5705
Croatia	21	693	147	5560
Mozambique	-	-	405	4769
Malaysia	2	30	71	3120
Other countries	7553	38243	617	16011

FUTURE OUTLOOK

The cement industry is vital for the development of infrastructure all over the world as no other material is likely to be its substitute in the near future. Infrastructure and industrial activity, real estate business and investment in core sectors mainly drive the demand for cement. Some emerging markets for cement demand are concrete roads, concrete canal lining and rural construction (housing). Over 65% demand for cement arises from construction sector.

The country is self-sufficient in cement. Most of the cement plants in India have the state-of-the-art technology and production facilities. The liberalisation policies for cement industry have helped in achieving the strong growth of the cement sector. Cement industry is going ahead with a modification and upgradation of technology particularly in energy conservation.

The Working Group on Cement Industry constituted by the Planning Commission for the 12th Five-Year Plan period has projected a demand growth at the rate of 10.75% per annum during the plan period at an expected 9% GDP growth rate. The Working Group expects that the additional installed capacity requirement would be 139.7 million tonnes by 2017 and 1035.3 million tonnes by 2027.

CEMENT

Based on the demand growth projection the consumption of cement by the end of the 12th Five Year Plan would be between 366.9 million tonnes and 397.4 million tonnes assuming growth rates of 9.75% to 10.75% during the Plan period.

The production and installed capacity estimated at 479.3 million tonnes and 407.4 million tonnes, respectively, (with a capacity utilisation of 85% in 2016-17). Reviewing the technology status of the Indian Cement Industry, the Working Group has observed that although the modern cement plants have incorporated the latest technology, yet there is scope for further improvement in the areas of in-pit crushing and conveying, pipe conveyors, co-processing of waste derived/hazardous combustible wastes as fuel, neurofuzzy expert system, cogeneration of power, multi chamber/dome silos, bulk transport of cement, palletizing and shrink wrapping for packing & despatch.

The Working Group has observed that the cement industry's average energy consumption is estimated to be about 725 kcal/kg clinker thermal energy and 80 kWh/t cement electrical energy. It is expected that the industry's average thermal energy consumption by the end of 12th Plan (Year 2016-17) will come down to about 710 kcal/kg clinker and the average electrical energy consumption will come down to 78 kWh/t cement with continued efforts by all concerned. The Working Group has taken into consideration the following alternate energy sources/fuels having good potential in the present context of Indian economics to either partially or fully substitute coal in cement manufacture in the coming years, namely, pet coke, lignite, natural gas, and biomass wastes including fruit of *Jatropha Carcus*, *Pongamia* and *Algae*. The Report states that the cement industry in India has the potential to utilise the entire hazardous waste generation of the country, if found suitable.